Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

What is claimed is:

1. (original) A method for wireless communication between a first communication device and a second communication device, comprising:
   a. at a first communication device:
      i. receiving at a plurality of antennas signals transmitted by the second communication device;
      ii. determining a receive weight vector comprising a plurality of complex receive antenna weights for the plurality of antennas of the first communication device from the received signals;
      iii. computing a transmit weight vector by computing a conjugate of the receive weight vector, the transmit weight vector comprising a complex transmit antenna weight for each of plurality of antennas of the first communication device, wherein each complex transmit antenna weight has a magnitude and a phase whose values may vary with frequency across a bandwidth of the baseband signal, thereby generating a plurality of transmit signals each of which is weighted across the bandwidth of the baseband signal to be transmitted from corresponding ones of the plurality of antennas to the first communication device, wherein the magnitude of the complex transmit antenna weight

associated with each antenna is such that the power to be output at each antenna is the same and is equal to the total power to be output by all of the plurality antennas divided by the number of antennas and such that the sum of the power at each corresponding frequency across the plurality of transmit signals is equal to a constant; and

iv. applying the transmit weight vector to a baseband signal for transmission via the plurality of antennas of the first communication device to the second communication device;

b. at the second communication device:

i. receiving at a plurality of antennas signals transmitted by the first communication device;

ii. determining a receive weight vector comprising a plurality of complex receive antenna weights for the plurality of antennas of the second communication device from the received signals;

iii. computing a transmit weight vector by computing a conjugate of the receive weight vector, the transmit weight vector comprising a complex transmit antenna weight for each of plurality of antennas of the second communication device, wherein each complex transmit antenna weight has a magnitude and a phase whose values may vary with frequency across a bandwidth of the baseband signal, thereby generating a plurality of transmit signals each of which is weighted across the bandwidth of the baseband signal to be transmitted from corresponding ones of the plurality of

antennas to the second communication device, wherein the magnitude of the complex transmit antenna weight associated with each antenna is such that the power to be output at each antenna is the same and is equal to the total power to be output by all of the plurality antennas divided by the number of antennas and such that the sum of the power at each corresponding frequency across the plurality of transmit signals is equal to a constant; and

iv. applying the transmit weight vector to a baseband signal for transmission via the plurality of antennas of the second communication device to the first communication device;

c. wherein the first communication device repeats the steps of determining and computing each time signals are received from the second communication device to update the transmit weight vector for transmitting to the second communication device, and the second communication device repeats the steps of determining and computing each time signals are received from the first communication device to update the transmit weight vector for transmitting to the first communication device.

2. (original) The method of claim 1, wherein the bandwidth of the baseband signal processed by each of the first and second communication devices comprises K plurality of frequency sub-bands, and the magnitude of the complex transmit antenna weights associated with each of the plurality of antennas of the respective communication device is such that the power to be output by each

antenna is the same and is equal to 1/(KN) of the total power to be output for all of the K frequency sub-bands, where N is the number of antennas of the respective communication device.

3. (original) The method of claim 1, wherein steps (ii) through (iv) at each of the first and second communication devices are performed for each of K frequency sub-bands of the baseband signal that correspond to sub-carriers of a multi-carrier baseband signal or synthesized frequency sub-bands of a single carrier baseband signal.

4. (previously presented) The method of claim 2, and further comprising storing in the first communication device, for each of the N antennas, complex transmit antenna weights for a subset of the K frequency sub-bands or sub-carriers.

5. (previously presented) The method of claim 4, and further comprising retrieving the stored subset of complex transmit antenna weights and generating therefrom the complete set of antenna weights for all of the K frequency sub-bands or sub-carriers using interpolation techniques.

6. 6-10. (Canceled)